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(54) **PHOTO-COUPLED DATA ACQUISITION SYSTEM AND METHOD**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

494,572 A	4/1893	Johnson
4,754,639 A	7/1988	Rich et al.

(Continued)

FOREIGN PATENT DOCUMENTS

WO	2006017141 A2	2/2006
WO	2010059176 A1	5/2010
WO	2012038415 A1	3/2012

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(57) **ABSTRACT**

The photo-coupled data acquisition system can have a container having a contour wall extending upwardly from a closed bottom, for containing a sample therein, a light emitter operable to emit diffused light into the container at an initial intensity, a photodetector operable to detect a reflected intensity of the diffused light, and a structure connected to the contour wall and holding the light emitter and the photodetector at a predetermined height above the bottom of the container and in an orientation facing inside the container, wherein during operation of the system, the initial light intensity is attenuated by the sample and the reflected intensity thereof can be correlated to an information value concerning a variable of interest of the sample.

15 Claims, 5 Drawing Sheets